REMARKS

Favorable reconsideration of this application is respectfully requested in view of the above amendments and following remarks. The title of the specification is amended. Claim 1 is amended and supported throughout Applicants' disclosure, for instance, in the Examples and in original claim 9. Claim 9 is canceled without prejudice or disclaimer. Claim 20 also is added and supported in the Examples of Applicants' disclosure. No new matter has been added. Claims 1-7, 10-13, 16, 19, and 20 are pending.

Regarding the Information Disclosure Statement (IDS) filed March 26, 2007, Applicants respectfully resubmit the IDS with the papers submitted herewith, and include the Form 1449 in order to address the issues raised by the Examiner. Applicants respectfully request that the information contained in the instant IDS be considered and that the Form 1449 be initialed and returned to Applicants' representative.

The specification is objected to because the title is considered not descriptive. Applicants have amended the title as suggested by the Examiner and to expedite prosecution. Withdrawal of the objection is respectfully requested.

Applicants appreciate the Examiner's courtesy in interviewing this application on November 9, 2007. In the interview, the obviousness rejection in view of Gyoten et al. and Stonehart et al. was discussed. The Examiner maintained that the references disclose the features of the claimed invention, and while the references do not explicitly disclose that a molecule comprising an ion-conducting functional group serving as an electrolyte is chemically bonded to a surface of the other particles, the Examiner believes that some bonding would occur, unless Applicants could show differences in the claimed features, or show that no bonding would occur when combining the referenced disclosures of Gyoten et al. and Stonehart et al. Applicants' representative disagreed with the Examiner's interpretation of the references, but asked the Examiner whether amending the claim to include a product-by-process limitation would overcome the rejection. The Examiner indicated that submitting an amendment of the claim with a product-by-process limitation such as disclosed in Applicants' Examples, along with supporting evidence to show the advantages obtained by the claimed invention, would be helpful in overcoming the rejection and taken under consideration. As another matter, the Examiner also indicated that evidence showing that no chemical bonding occurs when the catalyst of

Gyoten et al. is mixed with the silica as employed in Stonehart et al. also would help in overcoming the rejection. No formal agreement was made and Applicants submit the present response for consideration.

Turning to the substance of the Office Action, claims 1-7, 9-13, 16, and 19 were rejected under 35 U.S.C. 103(a) as being unpatentable over Gyoten et al. (US 6746793), in view of Stonehart et al. (US 5523181). Applicants respectfully traverse the rejection to the extent it is maintained.

Claim 1 is directed to a fuel cell including a catalyst layer having a mixture of catalyst particles and other particles, where the catalyst layer is obtained by chemically bonding a molecule comprising an ion-conducting functional group serving as an electrolyte to a surface of the other particles and then mixing the other particles and the catalyst particles. Further, claim 1 recites that the chemical bond is a covalent bond formed by an elimination reaction.

The fuel cell of claim 1 provides advantageous results where catalyst layer performance is enhanced. In accordance with claim 1, the molecule containing an ion-conducting functional group is bonded firmly to the surface of the other particles by the covalent bond formed by the elimination reaction. Thereafter, while the molecule containing the ion-conducting functional group is being bonded firmly to the surface of the other particles by the covalent bond, the other particles and the catalyst particles are mixed. (See Figures 6 and 9.) As a result, the surface of the inorganic particles may have higher densities of ion-conducting functional groups to which the molecule can be chemically bonded. That is, more molecules containing an ion-conducting functional group can be bonded to the surface of the inorganic particles. (See for example page 7, lines 8-14 of Applicants' disclosure.) Accordingly, an effective reaction area for the catalyst can be increased, thereby permitting higher voltages, since less electrolyte is eluted from the catalyst layer. (See voltage results shown in Tables 2 and 3, for example unit cells 3-8, and page 20 of Applicants' disclosure.)

Gyoten et al. and Stonehart et al. do not disclose or suggest claim 1. For example, Gyoten et al. and Stonehart et al. do not disclose or suggest a catalyst layer having a molecule comprising an ion-conducting functional group serving as an electrolyte being chemically bonded to a surface of the other particles and with the other particles and the

catalyst particles mixed, and the references do not disclose or suggest that the chemical bond is a covalent bond formed by an elimination reaction. Applicants acknowledge the comments in the Office Action that the combined references do not disclose a silane (i.e. molecule) that is chemically bonded to the surface of silica particles (i.e. other particles). However, the rejection contends that such a feature is inherent given that Gyoten et al. and Stonehart et al. utilize the same molecular compound and silica particles in forming the catalyst layers. Applicants respectfully disagree that such feature is inherent and contend that without more, the references fail to satisfy the feature of a molecule chemically bonded to the other particles as required by claim 1. Further, Applicants respectfully submit that in order to chemically bond the molecule to the other particles, a chemical reaction must be performed and that the presence of the materials without more does not result in such bonding. The cited references provide no reasonable technical basis to assume that the catalyst layer would include a molecule comprising an ion–conducting functional group serving as an electrolyte being chemically bonded to a surface of the other particles, where the other particles and the catalyst particles are mixed, and where the chemical bond is a covalent bond formed by an elimination reaction. Even if the alleged material in Gyoten et al. and Stonehart et al. could be combined, which Applicants do not concede, such combination without more fails to arrive at the fuel cell of claim 1.

Moreover, there is no motivation or suggestion in the references so as to arrive at the claimed invention. As noted, the references in fact do not mention a catalyst layer having a molecule comprising an ion–conducting functional group serving as an electrolyte being chemically bonded to a surface of the other particles and with the other particles and the catalyst particles mixed, and do not mention that the chemical bond is a covalent bond formed by an elimination reaction. Neither Gyoten et al. nor Stonehart et al. discuss the benefits that may be obtained by chemically bonding the molecule to the surface of the other particles, nor do the references provide any suggestion that the combined references would enjoy the advantageous results of the claimed invention. Thus, claim 1 is not obvious and is patentable over Gyoten et al. and Stonehart et al. for at least the foregoing reasons. Claims 2-7, 9-13, 16, and 19 depend upon and further limit claim 1 and are patentable for at least the same reasons with respect to claim 1.

Favorable reconsideration and withdrawal of the rejection are respectfully requested.

In view of the above amendments and remarks, Applicants believe that the pending claims are in a condition for allowance. Favorable consideration in the form of a Notice of Allowance is respectfully solicited. If any questions arise regarding this communication, the Examiner is invited to contact Applicants' representative listed below.

Respectfully submitted,

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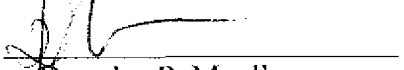
By: 
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